CONTENTS

Volume 27 Number 1

Thomas F. Hess and **Steven K. Schmidt** — 1 Improved procedure for obtaining statistically valid parameter estimates from soil respiration data

S. U. Sarathchandra, M. E. di Menna, G. Burch, J. A. Brown, R. N. Watson, N. L. Bell and **N. R. Cox** — 9 Effects of plant-parasitic nematodes and rhizosphere micro-organisms on the growth of white clover (*Trifolium repens* L.) and perennial ryegrass (*Lolium perenne* L.)

D. Barraclough and **G. Puri** — 17 The use of ^{15}N pool dilution and enrichment to separate the heterotrophic and autotrophic pathways of nitrification

Noam Gressel, Yossi Inbar, Arieh Singer and **Yona Chen** — 23 Chemical and spectroscopic properties of leaf litter and decomposed organic matter in the Carmel Range, Israel

Sovan Roy and **J. S. Singh** — 33 Seasonal and spatial dynamics of plant-available N and P pools and N-mineralization in relation to fine roots in a dry tropical forest habitat

K. Toyota, M. Kitamura and **M. Kimura** — 41 Suppression of *Fusarium oxysporum* f. sp. *raphani* PEG-4 in soil following colonization by other *Fusarium* spp

L. C. Burns, R. J. Stevens, R. V. Smith and **J. E. Cooper** — 47 The occurrence and possible sources of nitrite in a grazed, fertilized, grassland soil

R. Lensi, A. Clays-Josserand and **L. Jocteur Monrozier** — 61 Denitrifiers and denitrifying activity in size fractions of a mollisol under permanent pasture and continuous cultivation

E. Benizri, A. Courtade and **A. Guckert** — 71 Fate of two microorganisms in maize simulated rhizosphere under hydroponic and sterile conditions

Robert A. Maxwell and **David C. Coleman** — 79 Seasonal dynamics of nematode and microbial biomass in soils of riparian-zone forests of the Southern Appalachians

Mark Brundrett and **Sato Juniper** — 85 Non-destructive assessment of spore germination of VAM fungi and production of pot cultures from single spores

Henrik Christensen, Regin Rønn, Flemming Ekelund and **Søren Christensen** — 93 Bacterial production determined by [^3H]thymidine incorporation in field rhizospheres as evaluated by comparison to rhizodeposition

Janna Pietikäinen and **Hannu Fritze** — 101 Clear-cutting and prescribed burning in coniferous forest: comparison of effects on soil fungal and total microbial biomass, respiration activity and nitrification

Short Communications

J. F. Slattery and **D. R. Coventry** — 111 Acid-tolerance and symbiotic effectiveness of *Rhizobium leguminosarum* bv. *trifolii* isolated from subterranean clover growing in permanent pastures

A. Gorissen, J. H. Van Ginkel, J. J. B. Keurentjes and **J. A. Van Veen** — 117 Grass root decomposition is retarded when grass has been grown under elevated CO_2

Forthcoming Papers — I

Volume 27 Number 2

M. A. Falcón, A. Rodríguez, A. Carnicero, V. Regalado, F. Perestelo, O. Milstein and **G. De la Fuente** — 121 Isolation of microorganisms with lignin transformation potential from soil of Tenerife island

W. De Boer, P. A. Klein Gunnewiek and **H. J. Laanbroek** — 127 Ammonium-oxidation at low pH by a chemolithotrophic bacterium belonging to the genus *Nitrosospira*

L. D. J. Penrose 133 Two wheat genotypes differ in root disease due to *Gaeumannomyces graminis* without interaction with site

J. M. Boissier and D. Fontvieille 139 Biological characteristics of forest soils and seepage waters during simulated rainfalls of high intensity

Arata Katayama, Tohru Mori and **Shozo Kuwatsuka** 147 Abiotic dissipation of chlorothalonil in soil accelerated by amendment with high applications of farmyard manure

Pamela A. Harris, Harry H. Schomberg, Philip A. Banks and **Joel Giddens** 153 Burning, tillage and herbicide effects on the soil microflora in a wheat–soybean double-crop system

Christiane Gallet and **Philippe Lebreton** 157 Evolution of phenolic patterns in plants and associated litters and humus of a mountain forest ecosystem

R. L. Bradley and **J. W. Fyles** 167 A kinetic parameter describing soil available carbon and its relationship to rate increase in C mineralization

R. A. Janzen, J. F. Dormaar and **W. B. McGill** 173 A community-level concept of controls on decomposition processes: decomposition of barley straw by *Phanerochaete chrysosporium* or *Phlebia radiata* in pure or mixed culture

R. A. Janzen, F. D. Cook and **W. B. McGill** 181 Compost extract added to microcosms may simulate community-level controls on soil microorganisms involved in element cycling

R. A. Janzen and **W. B. McGill** 189 Community-level interactions control proliferation of *Azospirillum brasilense* Cd in microcosms

Katsuji Watanabe and **Koichi Hayano** 197 Seasonal variation of soil protease activities and their relation to proteolytic bacteria and *Bacillus* spp in paddy field soil

S. J. González-Prieto and **T. Carballas** 205 N biochemical diversity as a factor of soil diversity

J. Swinnen, J. A. Van Veen and **R. Merckx** 211 Root decay and turnover of rhizodeposits in field-grown winter wheat and spring barley estimated by ^{14}C pulse-labelling

Seiya Tsushima, Akira Hasebe, Yukiomi Komoto, John P. Carter, Kiyotaka Miyashita, Kazunari Yokoyama and **Roger W. Pickup** 219 Detection of genetically engineered microorganisms in paddy soil using a simple and rapid "nested" polymerase chain reaction method

Erland Bååth, Åsa Frostegård, Taina Pennanen and **Hannu Fritze** 229 Microbial community structure and pH response in relation to soil organic matter quality in wood-ash fertilized, clear-cut or burned coniferous forest soils

Short Communications

R. M. Rael and **W. T. Frankenberger Jr** 241 Detection of selenomethionine in the fulvic fraction of a seleniferous sediment

G. E. St. J. Hardy and **K. Sivasithamparam** 243 Antagonism of fungi and actinomycetes isolated from composted eucalyptus bark to *Phytophthora drechsleri* in a steamed and non-steamed composted eucalyptus bark-amended container medium

L. Crippa and **P. Zaccheo** 247 Effect of composting on short-term transformations in soil of ^{15}N-labelled plant residues

Forthcoming Papers I

Volume 27 Number 3

Shidong Li 251 Quantitative assay of *Rhizoctonia solani* Kühn AG-1 in soil

P. Illmer and **F. Schinner** 257 Solubilization of inorganic calcium phosphates—solubilization mechanisms

P. Illmer, A. Barbato and **F. Schinner** 265 Solubilization of hardly-soluble $AlPO_4$ with P-solubilizing micro-organisms

J. T. A. Verhoeven and **E. Toth** 271 Decomposition of *Carex* and *Sphagnum* litter in fens: effect of litter quality and inhibition by living tissue homogenates

G. Tian, L. Brussaard and **B. T. Kang** 277 Breakdown of plant residues with contrasting chemical compositions under humid tropical conditions: effects of earthworms and millipedes

Meadow B. Goldman, Peter M. Groffman, Richard V. Pouyat, Mark J. McDonnell and **Steward T. A. Pickett** 281 CH_4 uptake and N availability in forest soils along an urban to rural gradient

I. Weissenhorn, M. Mench and **C. Leyval** 287 Bioavailability of heavy metals and arbuscular mycorrhiza in a sewage-sludge-amended sandy soil

F. Gourbiere and **D. Debouzie** 297 Spatial distribution and estimation of forest floor components in a 37-year-old *Casuarina equisetifolia* (Forst.) plantation in coastal Senegal

Outi Priha and **Aino Smolander** 305 Nitrification, denitrification and microbial biomass N in soil from two N-fertilized and limed Norway spruce forests

K. G. Ofosu-Budu, K. Noumura and **K. Fujita** 311 N_2 fixation, N transfer and biomass production of soybean cv. Bragg or its supernodulating nts1007 and sorghum mixed-cropping at two rates of N fertilizer

H. Ferris, S. Lau and **R. Venette** 319 Population energetics of bacterial-feeding nematodes: respiration and metabolic rates based on CO_2 production

B. H. Byrnes, E. R. Austin and **B. K. Tays** 331 Methane emissions from flooded rice soils and plants under controlled conditions

Patrick J. Bohlen and **Clive A. Edwards** 341 Earthworm effects on N dynamics and soil respiration in microcosms receiving organic and inorganic nutrients

R. Baziramakenga, R. R. Simard and **G. D. Leroux** 349 Determination of organic acids in soil extracts by ion chromatography

Robert P. Larkin, James T. English and **Jeanne D. Mihail** 357 Identification, distribution and comparative pathogenicity of *Pythium* spp associated with alfalfa seedlings

Vincent Vandepitte, Paul Quataert, Helene de Rore and **Willy Verstraete** 365 Evaluation of the Gompertz function to model survival of bacteria introduced into soils

Short Communications

Michael J. Rowell 373 Colorimetric method for CO_2 measurement in soils

D. W. Hopkins, L. Anderson and **S. E. Scott** 377 N and C mineralization in soil amended with the N immobilization inhibitor, methionine sulphoximine

Forthcoming Papers I

Volume 27 Number 4/5

10th AUSTRALIAN NITROGEN FIXATION CONFERENCE

H. V. A. Bushby, R. A. Date and **P. J. Dart** vii Preface

Metabolic Pathways

L. Copeland, H.-S. Lee and **N. Cowlishaw** 381 Carbon metabolism in chickpea nodules

S. M. Brown, K. J. Oparka, J. I. Sprent and **K. B. Walsh** 387 Symplastic transport in soybean root nodules

Nodulation and N_2 Fixation in Shrubs and Trees

J. I. Sprent 401 Legume trees and shrubs in the tropics: N_2 fixation in perspective

N. Zou, P. J. Dart and **N. E. Marcar** 409 Interaction of salinity and rhizobial strain on growth and N_2-fixation by *Acacia ampliceps*

S. K. A. Danso, F. Zapata and **K. O. Awonaike** 415 Measurement of biological N_2 fixation in field-grown *Robinia pseudoacacia* L.

N. D. Purwantari, R. A. Date and **P. J. Dart** 421 Nodulation and N_2-fixation by *Calliandra calothyrsus* and *Sesbania sesban* grown at different root temperatures

P. A. Rosbrook and **P. Reddell** 427 Isolation of *Frankia* from root nodules of three species of *Casuarina*

Non-symbiotic N_2 Fixation

D. K. Kundu and **J. K. Ladha** 431 Efficient management of soil and biologically fixed N_2 in intensively-cultivated rice fields

K. L. Weier, P. A. Pittaway and **J. H. Wildin** 441 Role of N_2-fixation in the sustainability of the ponded grass pasture system

Sunietha Katupitiya, Peter B. New, Claudine Elmerich and **Ivan R. Kennedy** 447 Improved N_2 fixation in 2,4-D treated wheat roots associated with *Azospirillum lipoferum*: studies of colonization using reporter genes

Y. T. Tchan and **A. M. M. Zeman** 453 N_2 fixation (C_2H_2 reduction) in 2,4-dichloro-phenoxyacetic acid (2,4-D) treated wheat inoculated with free-living diazotrophs

D. Yu and **I. R. Kennedy** 459 Nitrogenase activity (C_2H_2 reduction) of *Azorhizobium* in 2,4-D-induced root structures of wheat

C. B. You, M. Lin, X. J. Fang and **W. Song** 463 Attachment of *Alcaligenes* to rice roots

M. M. Roper, R. R. Gault and **N. A. Smith** 467 Contribution to the N status of soil by free-living N_2-fixing bacteria in a lucerne stand

Microbe–Plant Genetic Interactions in N_2 Fixation

G. Stacey, J. Sanjuan, S. Luka, T. Dockendorff and **R. W. Carlson** 473 Signal exchange in the *Bradyrhizobium*–soybean symbiosis

B. G. Rolfe, M. A. Djordjevic, J. J. Weinman, J. McIver, E. Gärtner, H. Chen, E. H. Creaser, K. Britt, C. G. R. Lawson, M. H. de Boer, I. A. McKay, M. V. Shoobridge, J. de Majnik, C. Pittock, K. Broderick and **T. Delbridge** 485 Molecular genetic analysis of subterranean clover–microbe interactions

D. M. Gordon, M. Wexler, T. B. Reardon and **P. J. Murphy** 491 The genetic structure of *Rhizobium* populations

Kate J. Wilson 501 Molecular techniques for the study of rhizobial ecology in the field

A. E. Richardson, L. A. Viccars, J. M. Watson and **A. H. Gibson** 515 Differentiation of *Rhizobium* strains using the polymerase chain reaction with random and directed primers

P. J. Murphy, W. Wexler, W. Grzemski, J. P. Rao and **D. Gordon** 525 Rhizopines—their role in symbiosis and competition

M. Wexler, D. Gordon and **P. J. Murphy** 531 The distribution of inositol rhizopine genes in *Rhizobium* populations

O. P. Rupela and **C. Johansen** 539 Identification of non-nodulating, and low and high nodulating plants in pigeonpea

N_2 Fixation in Agricultural Production Systems

D. F. Herridge, H. Marcellos, W. L. Felton, G. L. Turner and **M. B. Peoples**	545	Chickpea increases soil-N fertility in cereal systems through nitrate sparing and N_2 fixation
M. B. Peoples, R. R. Gault, B. Lean, J. D. Sykes and **J. Brockwell**	553	Nitrogen fixation by soybean in commercial irrigated crops of central and southern New South Wales
L. Song, B. J. Carroll, P. M. Gresshoff and **D. F. Herridge**	563	Field assessment of supernodulating genotypes of soybean for yield, N_2 fixation and benefit to subsequent crops
D. M. Wheatley, D. A. MacLeod and **R. S. Jessop**	571	Influence of tillage treatments on N_2 fixation of soybean
J. E. Thies, P. W. Singleton and **B. B. Bohlool**✠	575	Phenology, growth, and yield of field-grown soybean and bush bean as a function of varying modes of N nutrition
M. J. Unkovich, J. S. Pate, E. L. Armstrong and **P. Sanford**	585	Nitrogen economy of annual crop and pasture legumes in south-west Australia
J. Brockwell, R. R. Gault, M. B. Peoples, G. L. Turner, D. M. Lilley and **F. J. Bergersen**	589	N_2 fixation in irrigated lucerne grown for hay
A. R. Anuar, Z. H. Shamsuddin and **O. Yaacob**	595	Contribution of legume-N by nodulated groundnut for growth of maize on an acid soil
J. G. Howieson	603	Rhizobial persistence and its role in the development of sustainable agricultural systems in Mediterranean environments
F. J. Bergersen, A. H. Gibson and **I. Licis**	611	Growth and N_2-fixation of soybeans inoculated with strains of *Bradyrhizobium japonicum* differing in energetic efficiency and PHB utilization
Janine M. Carter, James S. Tieman and **Alan H. Gibson**	617	Competitiveness and persistence of strains of rhizobia for faba bean in acid and alkaline soils
R. D. M. Simanungkalit, A. Indrasumunar, E. Pratiwi, R. D. Hastuti and **R. J. Roughley**	625	Population dynamics of soybean root-nodule bacteria in latosol soil used for upland and lowland rice/soybean cropping systems in West Java, Indonesia
J. F. Slattery and **D. R. Coventry**	629	Immunological anomalies associated with the identification of nodule bacteria
J. E. Thies, P. L. Woomer and **P. W. Singleton**	633	Enrichment of *Bradyrhizobium* spp populations in soil due to cropping of the homologous host legume

Nodulation and N_2 Fixation Under Environmental Stress

K. B. Walsh	637	Physiology of the legume nodule and its response to stress
E. A. E. Elsheikh and **M. Wood**	657	Nodulation and N_2 fixation by soybean inoculated with salt-tolerant rhizobia or salt-sensitive bradyrhizobia in saline soil
M. B. Peoples, D. M. Lilley, V. F. Burnett, A. M. Ridley and **D. L. Garden**	663	Effects of surface application of lime and superphosphate to acid soils on growth and N_2 fixation by subterranean clover in mixed pasture swards
D. J. Koopman, P. G. Tow, T. G. Reeves and **A. H. Gibson**	673	Soil acidification, chlorsulfuron application and *Rhizobium meliloti* as factors in lucerne yield decline
M. Marziah, S. Z. Ariffin and **Z. H. Shamsuddin**	679	Effects of Al on growth, nodulation and polyphenol oxidase activities in groundnut

Advances in Inoculant and Seed Inoculation Technology

J. Brockwell and **P. J. Bottomley**	683	Recent advances in inoculant technology and prospects for the future
P. E. Olsen, W. A. Rice and **M. M. Collins**	699	Biological contaminants in North American legume inoculants
W. A. Rice, P. E. Olsen and **M. E. Leggett**	703	Co-culture of *Rhizobium meliloti* and a phosphorus-solubilizing fungus (*Penicillium bilaii*) in sterile peat

R. J. Roughley, R. D. M. Simanungkalit, L. G. Gemell, E. J. Hartley and P. Cain 707 Growth and survival of root-nodule bacteria in legume inoculants stored at high temperatures

L. G. Gemell, E. J. Hartley and R. J. Roughley 713 Counting *Rhizobium* sp. (*Phaseolus*) by a plant-infection method using a small-seeded cultivar of *Phaseolus silvestre* L. grown enclosed in test tubes

H. N. Patrick and W. L. Lowther 717 Influence of the number of rhizobia on the nodulation and establishment of *Trifolium ambiguum*

W. L. Lowther and H. N. Patrick 721 *Rhizobium* strain requirements for improved nodulation of *Lotus corniculatus*

M. A. Sattar, M. A. Quader and S. K. A. Danso 725 Nodulation, N_2 fixation and yield of chickpea as influenced by host cultivar and *Bradyrhizobium* strain differences

F. Y. Hafeez, S. Asad, T. Ahmad and K. A. Malik 729 Host specificity and characterization of fast-growing rhizobia from *Macroptilium atropurpureum* cv. Siratro in Pakistan

L. Marufu, N. Karanja and M. Ryder 735 Legume inoculant production and use in East and Southern Africa

Forthcoming Papers I

Volume 27 Number 6

D. G. Keerthisinghe and R. L. Blakeley 739 Inhibition of jack bean urease by phosphoric- and thiophosphorictriamides

Joy S. Clein and Joshua P. Schimel 743 Nitrogen turnover and availability during succession from alder to poplar in Alaskan taiga forests

Miko U. F. Kirschbaum 753 The temperature dependence of soil organic matter decomposition, and the effect of global warming on soil organic C storage

M. A. Negrín, S. González-Carcedo and J. M. Hernández-Moreno 761 P fractionation in sodium bicarbonate extracts of andic soils

C. P. Chanway 767 Differential response of western hemlock from low and high elevations to inoculation with plant growth-promoting *Bacillus polymyxa*

J. N. Ladd, M. Amato, P. R. Grace and J. A. Van Veen 777 Simulation of ^{14}C turnover through the microbial biomass in soils incubated with ^{14}C-labelled plant residues

S. Issa and M. Wood 785 Multiplication and survival of chickpea and bean rhizobia in dry soils: the influence of strains, matric potential and soil texture

Reuben A. C. Morris, J. R. Coley-Smith and J. M. Whipps 793 Quantitative isolation of the mycoparasite *Verticillium biguttatum* from soil

T. W. Speir, H. A. Kettles, A. Parshotam, P. L. Searle and L. N. C. Vlaar 801 A simple kinetic approach to derive the ecological dose value, ED_{50}, for the assessment of Cr(VI) toxicity to soil biological properties

J. Swinnen, J. A. Van Veen and R. Merckx 811 Carbon fluxes in the rhizosphere of winter wheat and spring barley with conventional vs integrated farming

D. A. Wardle and A. Ghani 821 Why is the strength of relationships between pairs of methods for estimating soil microbial biomass often so variable?

Ingvar Sundh, Catharina Mikkelä, Mats Nilsson and Bo H. Svensson 829 Potential aerobic methane oxidation in a Sphagnum-dominated peatland—controlling factors and relation to methane emission

L. C. Burns, R. J. Stevens and R. J. Laughlin 839 Determination of the simultaneous production and consumption of soil nitrite using ^{15}N

C. M. Monreal, M. Schnitzer, H.-R. Schulten, C. A. Campbell and D. W. Anderson 845 Soil organic structures in macro and microaggregates of a cultivated Brown Chernozem

Short Communication
R. Monaghan 855 Errors in estimates of gross rates of nitrogen mineralization due to non-uniform distributions of ^{15}N label

Erratum 861

Forthcoming Papers 862

Volume 27 Number 7

J. A. Lewis, D. R. Fravel and **G. C. Papavizas** 863 *Cladorrhinum foecundissimum*: a potential biological control agent for the reduction of *Rhizoctonia solani*

Bishal K. Sitaula, Lars R. Bakken and **Gunnar Abrahamsen** 871 CH_4 uptake by temperate forest soil: effect of N input and soil acidification

Audrey Meikle, Soheila Amin-Hanjani, L. Anne Glover, Kenneth Killham and **James I. Prosser** 881 Matric potential and the survival and activity of a *Pseudomonas fluorescens* inoculum in soil

David B. Nedwell and **Andrea Watson** 893 CH_4 production, oxidation and emission in a U.K. ombrotrophic peat bog: influence of SO_4^{2-} from acid rain

Katarina Hedlund and **Annakarin Augustsson** 905 Effects of enchytraeid grazing on fungal growth and respiration

Scott Subler, John M. Blair and **Clive A. Edwards** 911 Using anion-exchange membranes to measure soil nitrate availability and net nitrification

P. Louvrier, G. Laguerre and **N. Amarger** 919 Semiselective medium for isolation of *Rhizobium leguminosarum* from soils

S. J. González-Prieto, A. M. Domenach, H. Beaupied, A. Moiroud and **L. Jocteur-Monrozier** 925 Composition of organic-N and ^{15}N-labelling uniformity in alder leaves

Adamou Ibrahima, Richard Joffre and **Dominique Gillon** 931 Changes in litter during the initial leaching phase: an experiment on the leaf litter of Mediterranean species

Roland Lindqvist and **Göran Bengtsson** 941 Diffusion-limited and chemical-interaction-dependent sorption of soil bacteria and microspheres

M. D. Busto, N. Ortega and **M. Perez-Mateos** 949 Induction of β-glucosidase in fungal and soil bacterial cultures

H. Höper, C. Steinberg and **C. Alabouvette** 955 Involvement of clay type and pH in the mechanisms of soil suppressiveness to fusarium wilt of flax

R. D. Lovell, S. C. Jarvis and **R. D. Bardgett** 969 Soil microbial biomass and activity in long-term grassland: effects of management changes

Short Communication
S. P. Deng and **M. A. Tabatabai** 977 Cellulase activity of soils: effect of trace elements

Book Review 981

Forthcoming Papers I

Volume 27 Number 8

Jonathan J. Halvorson and **Jeffrey L. Smith** 983 Decomposition of lupine biomass by soil microorganisms in developing Mount St Helens' pyroclastic soils

P. J. Bohlen, R. W. Parmelee, J. M. Blair, C. A. Edwards and **B. R. Stinner** 993 Efficacy of methods for manipulating earthworm populations in large-scale field experiments in agroecosystems

Yvan Moënne-Loccoz and **R. W. Weaver** 1001 Plasmids influence growth of rhizobia in the rhizosphere of clover

J. Eriksen, R. D. B. Lefroy and **G. J. Blair** 1005 Physical protection of soil organic S studied using acetylacetone extraction at various intensities of ultrasonic dispersion

J. Eriksen, R. D. B. Lefroy and **G. J. Blair** 1011 Physical protection of soil organic S studied by extraction and fractionation of soil organic matter

C. S. Young, G. Lethbridge, L. J. Shaw and **R. G. Burns** 1017 Survival of inoculated *Bacillus cereus* spores and vegetative cells in non-planted and rhizosphere soil

Saranath Singh and **J. S. Singh** 1027 Microbial biomass associated with water-stable aggregates in forest, savanna and cropland soils of a seasonally dry tropical region, India

L. David Kuykendall and **William J. Hunter** 1035 Symbiotic ineffectiveness of *trpCD* deletion mutants of *Bradyrhizobium japonicum*

E. Lefebvre-Drouet et M. F. Rousseau 1041 Dissolution de différents oxyhydroxydes de fer par voie chimique et par voie biologique: importance des bacteries reductrices

Sanhita Gupta, Dilip K. Arora and **Alok K. Srivastava** 1051 Growth promotion of tomato plants by rhizobacteria and imposition of energy stress on *Rhizoctonia solani*

G. B. Reddy, R. A. Reinert and **Gwen Eason** 1059 Loblolly pine needle nutrient and soil enzyme activity as influenced by ozone and acid rain chemistry

Clive E. Pankhurst, Heather J. McDonald and **Bruce G. Hawke** 1065 Influence of tillage and crop rotation on the epidemiology of *Pythium* infections of wheat in a red-brown earth of South Australia

W. Streit, L. Botero, D. Werner and **D. Beck** 1075 Competition for nodule occupancy on *Phaseolus vulgaris* by *Rhizobium etli* and *Rhizobium tropici* strains can be efficiently monitored in an ultisol during the early stages of growth using a constitutive GUS gene fusion

B. A. Jaffee and **A. E. Muldoon** 1083 Susceptibility of root-knot and cyst nematodes to the nematode-trapping fungi *Monacrosporium ellipsosporum* and *M. cionopagum*

Peter D. Stahl, Timothy B. Parkin and **Neal S. Eash** 1091 Sources of error in direct microscopic methods for estimation of fungal biomass in soil

J. Hassink 1099 Density fractions of soil macroorganic matter and microbial biomass as predictors of C and N mineralization

Short Communications

F. W. Meijboom, J. Hassink and **M. van Noordwijk** 1109 Density fractionation of soil macroorganic matter using silica suspensions

H. Vierheilig, M. Alt, P. Mäder, T. Boller and **A. Wiemken** 1113 Spreading of *Glomus mosseae*, a vesicular–arbuscular mycorrhizal fungus, across the rhizosphere of host and non-host plants

Forthcoming Papers I

Volume 27 Number 9

R. F. Grant 1117 Mathematical modelling of nitrous oxide evolution during nitrification

S. Hu, D. C. Coleman, P. F. Hendrix and **M. H. Beare** 1127 Biotic manipulation effects on soil carbohydrates and microbial biomass in a cultivated soil

R. G. Joergensen, F. Schmaedeke, K. Windhorst and **B. Meyer** 1137 Biomass and activity of microorganisms in a fuel oil contaminated soil

E. J. Joner, J. Magid, T. S. Gahoonia and **I. Jakobsen** 1145 P depletion and activity of phosphatases in the rhizosphere of mycorrhizal and non-mycorrhizal cucumber (*Cucumis sativus* L.)

E. J. Joner and **I. Jakobsen** 1153 Growth and extracellular phosphatase activity of arbuscular mycorrhizal hyphae as influenced by soil organic matter

Morten Miller and **Richard P. Dick** 1161 Thermal stability and activities of soil enzymes as influenced by crop rotations

Christopher Neill, Marisa C. Piccolo, Paul A. Steudler, Jerry M. Melillo, Brigitte J. Feigl and **Carlos C. Cerri** 1167 Nitrogen dynamics in soils of forests and active pastures in the western Brazilian Amazon Basin

E. M. Ferreira and **I. V. Castro** 1177 Nodulation and growth of subterranean clover (*Trifolium subterraneum* L.) in soils previously treated with sewage sludge

Mary S. Viera-Vargas, Octávio C. de Oliveira, Carlos M. Souto, Georg Cadisch, Segundo Urquiaga and **Robert M. Boddey** 1185 Use of different ^{15}N labelling techniques to quantify the contribution of biological N_2 fixation to legumes

Mary S. Viera-Vargas, Carlos M. Souto, Segundo Urquiaga and **Robert M. Boddey** 1193 Quantification of the contribution of N_2 fixation to tropical forage legumes and transfer to associated grass

Liliana Gianfreda, Filomena Sannino and **Antonio Violante** 1201 Pesticide effects on the activity of free, immobilized and soil invertase

S. A. Moody, M. J. I. Briones, T. G. Piearce and **J. Dighton** 1209 Selective consumption of decomposing wheat straw by earthworms

Short Communications

S. Ruzicka, M. D. P. Norman and **J. A. Harris** 1215 Rapid ultrasonication method to determine ergosterol concentration in soil

M. Francesca Cotrufo, Phil Ineson and **J. Derek Roberts** 1219 Decomposition of birch leaf litters with varying C-to-N ratios

S. Mahimairaja, N. S. Bolan and **M. J. Hedley** 1223 Denitrification losses of N from fresh and composted manures

M. Šimek and **V. Šustr** 1227 Gas chromatographic microrespirometry: further improvement and application in animal ecophysiology

Joy S. Clein and **Joshua P. Schimel** 1231 Microbial activity of tundra and taiga soils at sub-zero temperatures

L. G. Greenfield 1235 Release of microbial cell N during chloroform fumigation

Forthcoming Papers I

Volume 27 Number 10

Fabienne Paris, Pascal Bonnaud, Jacques Ranger, Michel Robert and **Frederic Lapeyrie** 1237 Weathering of ammonium- or calcium-saturated 2:1 phyllosilicates by ectomycorrhizal fungi *in vitro*

G. W. McCarty, J. J. Meisinger and **F. M. M. Jenniskens** 1245 Relationships between total-N, biomass-N and active-N in soil under different tillage and N fertilizer treatments

L. Dendooven and **J. M. Anderson** 1251 Maintenance of denitrification potential in pasture soil following anaerobic events

L. Dendooven and **J. M. Anderson** 1261 Use of a "least square" optimization procedure to estimate enzyme characteristics and substrate affinities in the denitrification reactions in soil

Mark Mazzola, Phillip W. Stahlman and **Jan E. Leach** 1271 Application method affects the distribution and efficacy of rhizobacteria suppressive of downy brome (*Bromus tectorum*)

L. Beyer, C. Sorge, H.-P. Blume and **H.-R. Schulten** 1279 Soil organic matter composition and transformation in Gelic Histosols of coastal continental Antarctica

T. W. Speir, H. A. Kettles and **R. D. More** 1289 Aerobic emissions of N_2O and N_2 from soil cores: measurement procedures using ^{13}N-labelled NO_3^- and NH_4^+

T. W. Speir, H. A. Kettles and **R. D. More** 1299 Aerobic emissions of N_2O and N_2 from soil cores: factors influencing production from ^{13}N-labelled NO_3^- and NH_4^+

Elizabeth M. Scott, Elizabeth A. S. Rattray, J. I. Prosser, K. Killham, L. A. Glover, J. M. Lynch and **M. J. Bazin** 1307 A mathematical model for dispersal of bacterial inoculants colonizing the wheat rhizosphere

Sachindra Nath Mondal, Koji Kageyama and **Mitsuro Hyakumachi** 1319 Influence of soil matric potential on the debilitation of oospores of *Pythium aphanidermatum*

T. Aarnio and **P. J. Martikainen** 1325 Mineralization of C and N and nitrification in Scots pine forest soil treated with nitrogen fertilizers containing different proportions of urea and its slow-releasing derivative, ureaformaldehyde

Deborah F. C. Mulligan, E. Eirian Jones and **J. W. Deacon** 1333 Monitoring and manipulation of populations of *Pythium oligandrum*, *Pythium mycoparasiticum* and a *Papulaspora* species in soil

L. Landi, L. Badalucco and **P. Nannipieri** 1345 Changes in inorganic N and CO_2 evolution in soil induced by L-methionine-sulphoximine

Kenji Kouno, Yasuhiro Tuchiya and **Tadao Ando** 1353 Measurement of soil microbial biomass phosphorus by an anion exchange membrane method

Short Communication
M. Nishiyama, K. Senoo and **S. Matsumoto** 1359 Survival of a bacterium in microporous glass in soil

Forthcoming Papers I

Volume 27 Number 11

J. Wu, A. G. O'Donnell and **J. K. Syers** 1363 Influences of glucose, nitrogen and plant residues on the immobilization of sulphate-S in soil

M. Contin, M. De Nobili and **P. C. Brookes** 1371 Comparison of two methods for extraction of ATP from soil

Kenji Aoki, Kukizo Miyamoto, Shuichiro Murakami and **Ryu Shinke** 1377 Anaerobic synthesis of extracellular proteases by the soil bacterium *Bacillus* sp. AM-23: purification and characterization of the enzymes

M. K. Conyers, N. C. Uren and **K. R. Helyar** 1383 Causes of changes in pH in acidic mineral soils

Thomas Appel and **Fuli Xu** 1393 Extractability of ^{15}N-labelled plant residues in soil by electro-ultrafiltration

Bishal K. Sitaula, Lars R. Bakken and **Gunnar Abrahamsen** 1401 N-fertilization and soil acidification effects on N_2O and CO_2 emission from temperate pine forest soil

K. Chander, P. C. Brookes and **S. A. Harding** 1409 Microbial biomass dynamics following addition of metal-enriched sewage sludges to a sandy loam

Christopher D. Clegg, Jonathan M. Anderson, Hilary M. Lappin-Scott, Jan D. van Elsas and **Jenny M. Jolly** 1423 Interaction of a genetically modified *Pseudomonas fluorescens* with the soil-feeding earthworm *Octolasion cyaneum* (Lumbricidae)

D. J. Ross, T. W. Speir, H. A. Kettles and **A. D. Mackay** 1431 Soil microbial biomass, C and N mineralization and enzyme activities in a hill pasture: influence of season and slow-release P and S fertilizer

L. Carpenter-Boggs, T. E. Loynachan and **P. D. Stahl** 1445 Spore germination of *Gigaspora margarita* stimulated by volatiles of soil-isolated actinomycetes

Peter Capriel, Theodor Beck, Heinz Borchert, Jörn Gronholz and **Günter Zachmann** 1453 Hydrophobicity of the organic matter in arable soils

Jacek Kozdrój 1459 Microbial responses to single or successive soil contamination with Cd or Cu

B. J. Feigl, G. P. Sparling, D. J. Ross and **C. C. Cerri** 1467 Soil microbial biomass in Amazonian soils: evaluation of methods and estimates of pool sizes

Jos M. Raaijmakers, Ientse van der Sluis, Marita van den Hout, Peter A. H. M. Bakker and **Bob Schippers** 1473 Dispersal of wild-type and genetically-modified *Pseudomonas* spp from treated seeds or soil to aerial parts of radish plants

Donald Y. Kobayashi, Mirta Guglielmoni and **Bruce B. Clarke** 1479 Isolation of the chitinolytic bacteria *Xanthomonas maltophilia* and *Serratia marcescens* as biological control agents for summer patch disease of turfgrass

P. M. Stephens, C. W. Davoren and **B. G. Hawke** 1489 Influence of barley straw and the lumbricid earthworm *Aporrectodea trapezoides* on *Rhizobium meliloti* L5-30R, *Pseudomonas corrugata* 2140R, microbial biomass and microbial activity in a red-brown earth soil

Short Communications

D. L. Edgerton, J. A. Harris, P. Birch and **P. Bullock** 1499 Linear relationship between aggregate stability and microbial biomass in three restored soils

M. Sudhakara Reddy and **K. Natarajan** 1503 Effects of the fungicide Dithane M-45 on the growth and mycorrhizal formation of *Pinus patula* seedlings

Corrigendum 1505

Forthcoming Papers I

Volume 27 Number 12

Ernst Witter and **Sigrun Dahlin** 1507 Microbial utilization of [U-^{14}C]-labelled straw and [U-^{13}C]-labelled glucose in soils of contrasting pH and metal status

Martin Bender and **Ralf Conrad** 1517 Effect of CH_4 concentrations and soil conditions on the induction of CH_4 oxidation activity

S. Recous, D. Robin, D. Darwis and **B. Mary** 1529 Soil inorganic N availability: effect on maize residue decomposition

D. L. Chen, P. M. Chalk and **J. R. Freney** 1539 Distribution of reduced products of ^{15}N-labelled nitrate in anaerobic soils

Cees Verhagen, Eric Smit, Dick B. Janssen and **Jan Dirk van Elsas** 1547 Bacterial dichloropropene degradation in soil; screening of soils and involvement of plasmids carrying the *dhlA* gene

S. J. González-Prieto, H. Beaupied, A. Moiroud and **A. M. Domenach** 1559 Uniformity of labelling of alder leaves fertilized with NH_4^+-^{15}N and NO_3^--^{15}N by roots or leaves

R. L. Bradley and **J. W. Fyles** 1565 Growth of paper birch (*Betula papyrifera*) seedlings increases soil available C and microbial acquisition of soil-nutrients

W. Devliegher and **W. Verstraete** 1573 *Lumbricus terrestris* in a soil core experiment: nutrient-enrichment processes (NEP) and gut-associated processes (GAP) and their effect on microbial biomass and microbial activity

S. C. Jarvis, R. D. Lovell and **R. Panayides** 1581 Patterns of methane emission from excreta of grazing animals

P. P. Motavalli, C. A. Palm, W. J. Parton, E. T. Elliott and **S. D. Frey** 1589 Soil pH and organic C dynamics in tropical forest soils: evidence from laboratory and simulation studies

D. A. Wardle and **A. Ghani**	1601	A critique of the microbial metabolic quotient (qCO_2) as a bioindicator of disturbance and ecosystem development
Karen D. Burkhead, David A. Schisler and **Patricia J. Slininger**	1611	Bioautography shows antibiotic production by soil bacterial isolates antagonistic to fungal dry rot of potatoes
S. M. Neate and **A. M. Benger**	1617	Nylon netting technique for the study of the three dimensional growth of *Rhizoctonia solani* in soil
R. Monaghan and **D. Barraclough**	1623	Contributions to gross N mineralization from ^{15}N-labelled soil macroorganic matter fractions during laboratory incubation
Georg Guggenberger, Wolfgang Zech and **Richard J. Thomas**	1629	Lignin and carbohydrate alteration in particle-size separates of an oxisol under tropical pastures following native savanna
F. Mtambanengwe and **H. Kirchmann**	1639	Litter from a tropical savanna woodland (miombo): chemical composition and C and N mineralization
Short Communications		
D. Robinson and **C. M. Scrimgeour**	1653	The contribution of plant C to soil CO_2 measured using $\delta^{13}C$
C. Dolhem-Biremon, P. Mary and **R. Tailliez**	1657	Adhesion behaviour of *Bradyrhizobium japonicum* and *Bradyrhizobium elkanii* strains: evidence of duality between the two species
P. R. Dalby, G. H. Baker and **S. E. Smith**	1661	Glyphosate, 2,4-DB and dimethoate: effects on earthworm survival and growth
Forthcoming Papers	I	
Announcement	II	